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The development of interpersonal distance in children and adolescents

Ruth Sykes Bloom
University of the Pacific

THE DEVELOPMENT OF INTERPERSONAL DISTANCE IN CHILDREN AND ADOLESCENTS

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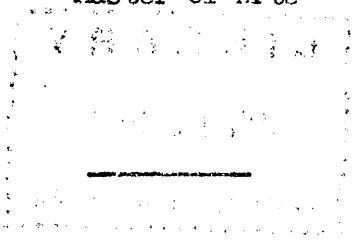

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by

Ruth Sykes Bloom

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This thesis, written and submitted by

Ruth Sykes Bloom

is approved for recommendation to the Committee on Graduate Studies, University of the Pacific.

Department Chairman or Dean:

Thesis Committee:

Chairman

Dated 11/30/73

This thesis is presented in two parts. The first part is written in the style prescribed by the American Psychological Association for journal articles. Included are introductory, methods, results and discussion sections, followed by tabular presentation of pertinent data. The second part consists of a comprehensive review of the literature, much broader in scope than is generally included in a journal article. This is followed by a complete list of references used.

THE DEVELOPMENT OF INTERPERSONAL DISTANCE IN CHILDREN AND ADOLESCENTS

Ruth S. Bloom

University of the Pacific

Sommer (1969) defines personal space as an area with invisible boundaries surrounding a person's body into which intruders may not come. The size and shape of this area is culturally determined; its boundaries are flexible, expanding and contracting under varying conditions; and the concept is acquired at a very early age (Hall, 1966; Sommer, 1969). Interpersonal distance is the personal space which individuals maintain between themselves and others for social interaction.

Only a few researchers have investigated interpersonal distance behavior as it develops in children and changes as the child matures. In one such study, based on naturalistic observations of groups visiting a zoo, Baxter (1970) reported that children stood closest to other members of their group, with adolescents next and adults standing farthest away. Measures were estimates made by observers as groups passed an arbitrary point. Age of subjects was approximated from physical appearance.

In contrast to this naturalistic setting, Guardo and Meisels (1971) used a projective technique in a controlled setting. Children in third through tenth grades were instructed to place a cut-out figure representing themselves in a face-to-face relation to a drawn silhouette. Findings indicated that a clearly identifiable spatial schemata developed across time and this schematization is well established by third grade. Shifts in personal space usage occurred in grades six or seven, which were more pronounced for males. Bass and Weinstein(1971) attempted to extend the study to younger children (ages 5 to 9) using a similar figure-placement technique. Results

indicated that kindergarten subjects maintained greater interpersonal distances than third grade subjects. However, examination of the responses given by children in different grades showed that a number of children placed the silhouettes representing themselves in inappropriate positions (upside down, much higher than the other figure, at an angle to, or with no distance between the figures.) This was related to grade level with 25% inappropriate placements in grades K through 2, and none in grade 3. The authors suggested that some technique other than projective figure-placement might be better with young subjects.

In a study of subcultural differences, Aiello and Jones (1973) investigated proxemic behavior of black and white first-, third-, and fifth-grade children. Pairs of subjects were assigned a problem to discuss and solve while observers unobtrusively scored the distances maintained between the children. Males of both subcultures stood less directly than females. This parallels sex differences found in adults, which suggests that children have begun to acquire sex-role behavior in elementary school. Subcultural differences were found in the early grade-school years; however, these differences disappeared among the older children. Further work, extending beyond the elementary school years was suggested, in order to investigate the changes that occurred in different age groups.

This was undertaken by Bloom, Harvey and Howells (1973) in a study using Spanish and Anglo subjects from kindergarten, third, sixth and ninth grades. Using the method developed by Horowitz, Duff and Stratton (1964), subjects were instructed to approach an inanimate object (music stand), and two peers of the same sex as the subject (one Anglo and one Spanish). Ethnic differences were not demonstrated. However, age differences followed a U-shaped

function with kindergarten and ninth grade subjects maintaining greater distances than third and sixth grade subjects. An Age x Sex interaction occurred, also. In the earlier grades (K and 3), sex differences in spacing behavior were not apparent. In the sixth grade group, the boys were more like the younger groups, whereas the girls were nearer the older group in distances maintained. By ninth grade, both boys and girls spaced themselves as adults do, with boys standing further from boys than girls stand from girls. All subjects approached closer to an inanimate object than they did to other persons, which was in keeping with earlier findings by Horowitz, et al. (1964).

The U-shaped relationship between age and interpersonal distance was surprising. The human infant's need for physical contact to insure healthy development has been well established (Bowlby, 1952; Harlow, 1959). Developmental studies (Parten, 1933) indicate that by kindergarten age, children are playing cooperatively with each other. It was expected, then, that the younger children would maintain a close physical relationship with their peers, with this distance widening as a function of age and acculturation until adult norms were reached. This expectation has been supported by previous research (Baxter, 1970; Guardo and Meisels, 1971). The main purpose of the present experiment was to investigate further the relationship between age and interpersonal distance. Secondary purposes were to extend the study to include twelfth grade subjects and to look at approaches made to opposite-sexed as well as same-sexed peers. If the sex differences that occurred at sixth and ninth grades were a function of the earlier adolescence of girls, then these differences might be more pronounced when sex of person to be approached is introduced as a variable. The Horowitz, et al. (1964) study was used as a model again, because it offers a simple method for accurate measurement of

interpersonal distances in a controlled situation.

Method

Subjects

The subjects were randomly selected from school children in kindergarten, third, sixth, ninth and twelfthgrades. Half were boys and half were girls, with a total of 150 subjects. To control for socioeconomic differences, subjects were from Colonial Heights Elementary School and Lincoln High School, Stockton, California, both of which have a homogeneous population of white middle-class students.

Apparatus

The equipment used was a music stand and two confederates, a girl and a boy, in each age group. The music stand was substituted for the hatrack used by Horowitz, et al. (1964) because its height could be adjusted to approximate that of the subjects. This met Horowitz's criterion that the inanimate object be of semi-human proportions. The confederates were of the same age as the subjects.

The music stand and the confederates were placed in a triangle twelve feet from each other. Placement of "objects" to be approached were rotated after every ten subjects so that each "object" occupied each position for an equal number of subjects. Starting positions #1, #2, and #3 were marked with masking tape twelve feet from objects #1, #2, and #3, respectively, in order to keep approach distance uniform. All approaches were frontal. Measurements were made by means of small pieces of masking tape marking six-inch intervals from the object being approached.

Procedure

The apparatus was set up on the unused stage for the elementary school

children and in a conference room of about the same proportions as the stage for the high-school subjects. Subjects were permitted to enter the experimental room one at a time. The experimenter instructed each subject as follows:

"We are interested in finding out about how different people walk. Just relax and walk over to the (girl, boy, music stand - whichever object was first for this subject) in your usual manner."

If subject was to approach object #1 first, he was started from position #1; object #2 from position #2 and object #3 from position #3. After the initial approach, subject did not return to starting position but proceeded to the next object from where he stood.

Measurements, reported to the nearest six inches, were of the shortest distance remaining between the subject and object approached when the subject came to a stop. When the experimenter had recorded this measurement, he then instructed the subject as follows:

"Now walk over to the (whichever object is next for this subject - girl, boy, or music stand)."

This was repeated until the subject had approached each object three times, nine measures having been recorded. Order of approach was rotated so that the three objects were approached in three different orders by a given subject. Over all subjects, each object appeared an equal number of times in each position.

Results

The design employed was a split-plot factorial 2$\cdot$5$\cdot$3 (Kirk, 1968) with Sex and Age as between-subjects variables and Object or Person Approached as the within-subjects variable. The dependent variable was the mean of the

three measures taken of the distance between subject and object or person approached. Approach distances represented distances maintained in interpersonal interactions. Analysis of variance was performed on these data, with alpha set at .05 for all analyses. (See Appendix Table I for summary table.)

Age

Age was a significant determiner of interpersonal distance (F = 5.27, df = 4, 140) and is shown in Figure 1. Trend analysis revealed significant linear and cubic trends (F = 9.98, 6.48; df = 1, 140) accounting for 47% and 31% of the variance respectively. The Newman-Keuls test was used to make all possible paired comparisons between ages (Appendix Table II). According to this test, kindergarten subjects maintained significantly more distance than third grade subjects, but third graders were not significantly different from sixth graders. No differences were found between ninth and twelfth graders, with these two groups maintaining significantly greater distances than any other age groups.

Sex x Object x Age Interaction

The Sex x Object x Age interaction was significant (F = 3.28, df = 8, 280). A test for simple effects of Age at each level of Sex/Object revealed that age differences were significant only for the distances maintained between boys approaching boys (F = 4.57, df = 4, 420) and girls approaching girls (F = 2.63, df = 4, 420). These means are shown in Figure 2. (See Appendix Table III for simple effects summary table.) A trend analysis was performed to determine if the changes occurring as a function of age would follow the same trends for both sexes. Quadratic and cubic trends (F = 7.63, 4.51; df = 1, 200) were significant in the data for boys approaching boys, while the data for girls approaching girls was significant for linear trend

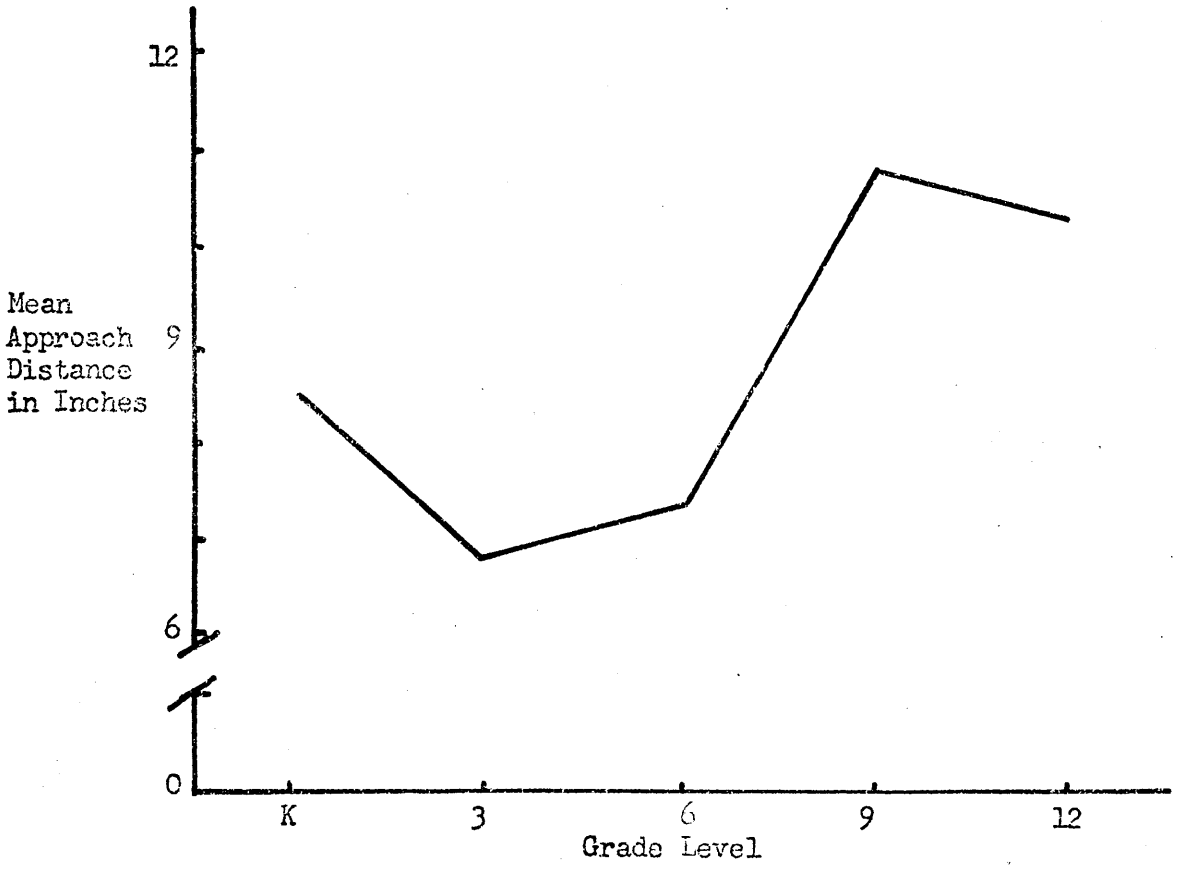

Figure 1

Mean approach distance of each age group

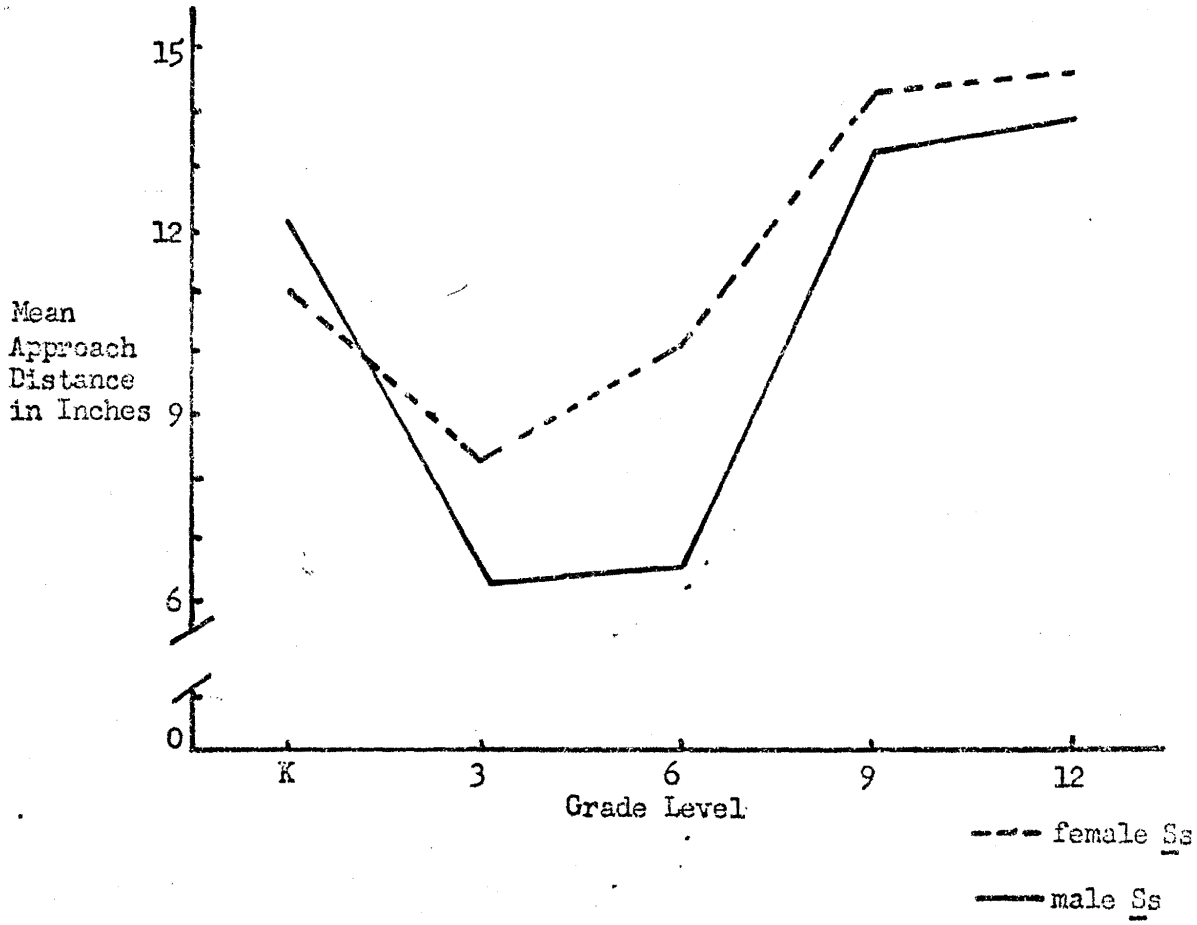

Figure 2

Mean approach distances to same sexed-peers at each level of age

only (F = 6.81; df = 1,200).

Sex x Age and Object x Age Interactions

The Sex x Age and Object x Age interactions were not significant.

Object

Whether subjects approached a music stand, a girl or a boy had a significant effect on the distance maintained (F = 281.18, df = 2, 280). A t test was used to compare space left between subjects and inanimate objects with that left between subjects and persons (males and females summed together). Objects were approached closer than persons (t = 22.62, df = 147).

Sex x Object Interaction

The interaction between Sex and Object approached was significant (F = 11.51, df = 2,280) with girls approaching girls closer than boys did, and boys approaching the music stand and boys closer than girls did. (Figure 3). A test for simple effects of Sex at each level of Object was carried out, which revealed that these differences between males and females in distances maintained from each object separately were not significant.

Sex

The main effect of sex of subject did not significantly affect approach distances.

Discussion

In the present study, as in others (Bass and Weinstein, 1971; Bloom, et al., 1973), kindergarten subjects maintained greater interpersonal distances than third graders. If these findings are a valid reflection of interpersonal distance needs as they change with age, then development is not so simple as has been assumed; that is, with youngest children using the least space and space use increasing with age. Whether the maintenance of greater distances

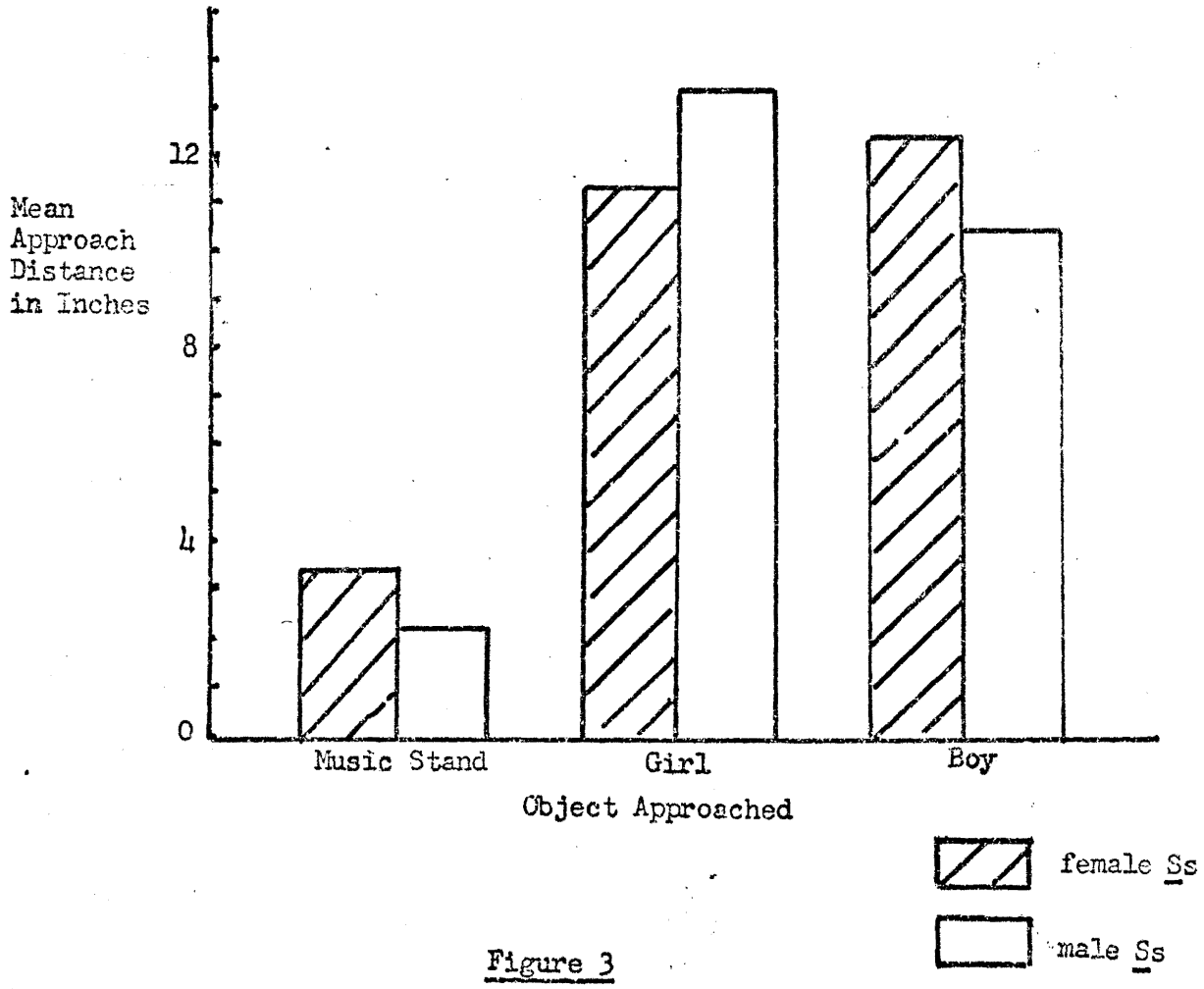

Figure 3

Mean approach distances for each sex

by kindergarteners is an accurate picture of spatial needs or simply measurement error needs to be investigated further. Bass and Weinstein speculated that the projective technique employed in their experiment was inappropriate for younger subjects (K-2nd grade) and that the results might not be reliable or valid because of this. However, the technique used in the present and the earlier Bloom, et al. study appears to be reliable and valid because of the relationship between space and object approached (music stand or person). Kindergarten subjects behaved like the older subjects in that they maintained much greater distances between themselves and persons than they did between themselves and the inanimate object, which replicates the findings of the Horowitz, et al. (1964) study in which the same technique was used with adults. Additional investigation of the spatial behavior of very young children is needed to determine if other techniques would elicit these same responses. Possibly, observation of unstructured playground activities might be more informative. The artificial setting in the present study may have evoked behaviors that would not occur under natural conditions.

No significant changes occurred between third and sixth grades. Between sixth and ninth grades there was a significant increase in distance maintained which may be due to the subjects having reached adolescence, as changes in spatial behavior occurring at puberty have been reported by other researchers (Beck, 1967; Bloom, et al., 1973; Guardo and Meisels, 1971). No further changes took place between ninth and twelfth grades, which tends to support the hypothesis that spatial development is established by ninth grade and that further changes will not occur as subjects mature. It should be noted, however, that spatial behavior of the elderly has been left unexplored. The empirical research to date has been with young and middle-aged adults and

whether changes occur after middle-age is not known. To complete the picture of the effects of age on spatial development, geriatric subjects should be studied.

Based on the present data, it appears that the periods between kindergarten and third grade and between sixth and ninth grades are critical in the development of personal space concepts. However, space usage cannot be predicted on the basis of age alone. Sex of subject, as well as sex of person approached, affects interpersonal distances and the effect is different at different ages. Boys undergo more radical changes than girls, with the greatest changes occurring in relation to other males.

Certainly more work is needed before this complex concept can be understood. Physical size and age of persons approached, as well as degree of acquaintance and social relationships with these persons, have been shown to affect interpersonal distance behavior in adults and should be investigated across the different age groups. Other settings and other techniques might yield different results. The more or less formal school environment might be producing different behaviors than would occur in a relaxed social setting. Subjects might, for instance, be instructed to deliver a message to the confederates in a naturalistic setting such as a lunchroom or playground. This also would circumvent the artificiality of having subjects "walk up to" the confederates, which may in itself induce behaviors that would not occur naturally.

In summary, positive findings indicate that: (1) There seems to be a reproducible pattern of spatial behavior which develops with age; (2) This pattern, reflecting the concept of interpersonal distance development, has its beginnings by grade three and undergoes significant changes between grades six and nine. By ninth grade the behavior is established and undergoes no

further significant changes with increased age. (3) Support is given to the reliability and validity of the measurement through replication of earlier studies (Bloom, et al., 1973; Horowitz, et al., 1964).

TABLE I

Analysis of Variance

Source	SS	df	MS	F	p <
Between Subjects	8,334.78	149	55.93		
Sex (A)	21.34	1	21.34	.43	
Age (C)	1,052.82	4	263.20	5.27	.01
Sex x Age (AC)	263.97	4	65.99	1.32	
Subj. within groups	6,996.65	140	49.98		
Within subjects	13,343.00	300	44.48		
Object (B)	8,272.41	2	4,136.20	281.18	.001
Sex x Object (AB)	338.48	2	169.24	11.51	.01
Object X Age (BC)	228.35	8	28.54	1.94	
Sex x Object x Age (ABC)	385.48	8	48.18	3.28	.01
B x subj. within groups	4,118.28	280	14.71		
Total	21,677.78	449			

TABLE II

Age: Differences Among Means

(Newman-Keuls test)

Grade	3rd	6th	K	12th	9th
3rd	-	1.7	4.9*	10.24**	11.67**
6th	-	-	3.2	8.54**	9.97**
K	-	-	-	5.34**	6.77**
12th	-	-	-	-	1.43
9th	-	-	-	-	-

*$p < .05$

**$p < .01$

TABLE III

Simple Effects of Age at Each Level of Sex/Object

Analysis of Variance

Source	SS	df	MS	F	p <
Between Age at boys/girls	105.39	4	26.35	.61	
Between Age at boys/music stand	51.68	4	12.92	.30	
Between Age at boys/boys	788.48	4	197.12	4.57	.01
Between Age at girls/girls	453.73	4	113.43	2.63	.05
Between Age at girls/music stand	149.01	4	37.25	.86	
Between Age at girls/boys	382.40	4	95.60	2.22	
Error		420	43.13		

Personal Space - A Review of the Literature

The environment and its effect on man is a topic that has become increasingly interesting to social scientists over the past twenty years. A number of researchers have attempted to determine the boundaries and characteristics of man's most proximate environment, his personal space. One of the first researchers was Edward T. Hall, who coined the term "proxemics". He defines proxemics as the "interrelated observations and theories of man's use of space as a specialized elaboration of culture" (1966, pp. 1). In a series of papers, using information gathered in interviews and observations, Hall (1955, 1959, 1960, 1963a, 1963b) has described cultural proxemic differences, various sensory cues used to judge distance, the manipulation of personal space as a form of non-verbal communication and developed a notation system for the study of personal space.

Edward Hall

In Hall's schema, personal space for man is divided into intimate distance, personal distance, social distance and public distance. Intimate distance, 0-18 inches, combines visual, olfactory and thermal sensory input. At this distance one is very aware of the other person's body; there is often visual distortion, a sensing of body heat and the sound, smell and feel of the other's breath. Personal distance, 18 inches - 4 feet, is that distance which comfortably separates individuals. It is a small, protective sphere, or bubble, which is maintained by the individual. Sensory feedback from other bodies is present but less intense than for intimate distance. Social distance, 4-12 feet, is the distance for conversing or conducting affairs on an impersonal level. Sensory input is confined to auditory and visual cues.

This is the distance for non-involvement with other persons. Public distance, greater than 12 feet, is well outside the circle of meaningful involvement with others. Sensory adjustments must be made at this distance. The voice, as well as facial expressions and movements, must be exaggerated or amplified. For a given individual, each of the zones has quite stable boundaries although the boundaries may fluctuate depending upon the immediate situation. In a crowd, for instance, a person's zone of intimacy does not extend beyond his outer clothing.

According to Hall's theories, then, each individual is surrounded by a series of fluctuating bubbles of space, each bubble defining a region for certain types of interactions. The system is complex, molded by culture and subject to considerable variation across cultures. The space defined as personal distance in one culture, for example, might be considered intimate distance in another culture. Man's sense of space is a synthesis of sensory inputs: visual, auditory, kinesthetic, olfactory and thermal. These "out-of-awareness" cues enable individuals to conform to the proxemic patterns of their culture without conscious effort.

Robert Sommer

Working independently, Robert Sommer came to similar conclusions. He concentrated on personal space, which he defines as an "area with invisible boundaries surrounding a person's body into which intruders may not come" (1969, pp. 26). This area is not necessarily spherical in shape, he contends, nor does it extend equally in all directions. It is a culturally acquired, portable territory, which is carried with the individual wherever he goes. There are major differences between cultures in the interpersonal distances that people maintain.

Sommer's investigations were somewhat more empirical in form than Hall's. The technique Sommer (1959, 1960) commonly used involved simply the invasion of the personal space of selected subjects with a description of their reactions. He found wide individual differences with no single response to someone's sitting too close; there were defensive gestures, shifts in posture and attempts to move away. Some people averted their heads and placed an elbow between themselves and the intruder, some adjusted the distance by shifting position. If these defenses failed or were ignored by the invader, the subject eventually left the area. These findings were supported in similar studies by Felipe (1966), and Felipe and Sommer (1966).

Sommer (1961, 1962, 1965, 1967) also concerned himself with the distances most effective in eliciting conversational interactions, the influence of various distances on leadership and the effect of distance on the interactions of hospital patients. In addition, he investigated how room size, conversational topic and the relationship between individuals affects the interpersonal distances maintained.

Cultural Differences

Both Hall and Sommer stated that there were cultural differences in personal space but the research attempting to demonstrate these differences is not conclusive. On the one hand, Watson and Graves (1966) found differences in spatial orientation (distance, shoulder orientation, and eye contact) between the Arab and American cultures and among geographical regions within these cultures; Willis (1966) found that, within the American culture, both Negroes and Caucasians stood further from Negroes than from Caucasians while conversing, although the differences were small (not significant); Baxter (1970) found that Mexicans of all ages and sexes stood closer to others than whites,

while blacks stood further away; Little (1968) found consistent differences in the use of space across cultures; and Aiello and Jones (1971, 1973) found that, in the early grades, Puerto Rican and black children stood closer to other people than middle-class white children, however these differences disappeared among the older children. On the other hand, Forston and Larson (1968) found no significant differences between Latin Americans and Americans; Jones found homogeneity of distance scores among four lower-class subcultures in New York City; Leibman (1970) found no differences between blacks and whites in interpersonal distances maintained; and Bloom, Harvey and Howells (1973) found no differences between Spanish and Anglo children and adolescents.

Sex

Sex differences have been demonstrated by many experimenters. Most of the data seems to indicate that females stay closer together than do males (Baxter, 1970; Bloom, et al., 1973; Campbell, Kruskal and Wallace, 1966; Dosey and Meisel, 1969; Leibman, 1970; Long, Ziller and Henderson, 1968; Lott and Sommer, 1967; Norum, Russo and Sommer, 1967; Sommer, 1960; Willis, 1966). Only one study (Aiello and Jones, 1971) found males maintaining smaller distances than females.

In a multivariable study which demonstrated a sex interaction, McBride, King and James (1965) found that individuals of each sex responded more to experimenters of the opposite sex than to experimenters of the same sex. Response was also affected by the direction of approach, being greater to approaches from the front than at the side, which was in turn greater than to approach from behind.

Non-verbal Behaviors

Judging from these contradictory findings, personal space is more than a simple matter of cultural origin or sex of subject. A number of studies have indicated that a wide variety of non-verbal behaviors is critical in the process of social interaction. Mehrabian (1968, 1969) found that the manipulation of degree of liking of an imagined stimulus person produced differences in amount of eye contact, interpersonal distance, body orientation, and body relaxation. The relationship between these non-verbal behaviors is apparently a reciprocal or compensatory one, he feels. Thus, in order to maintain interpersonal interactions at a comfortable level, when one dimension becomes too intense, compensation can be made by decreasing the level of a different dimension. This is accomplished through the defensive gestures described by Sommer and others. In a study by Patterson and Sechrest (1970) even confederates who had been trained to maintain a constant disposition across conditions, were observed to lessen the directness of body orientation in the closest conditions.

A multivariable study (Argyle and Dean, 1965) found a significant reduction of eye contact by the subject with increased proximity to the experimenter. A significant interaction between sex of subject and sex of experimenter was also found, with less eye-contact between mixed-sex pairs. In the closest condition, two feet, subjects also reduced intimacy by leaning backward, looking downward, shading their eyes, scratching their heads, etc. At ten feet, however, subjects showed a tendency to lean forward. A similar study by Goldberg, Kiesler and Collins (1969) supported these findings. These reactions are in keeping with Sommer's theories (1969) and Hall's (1966), both in the behaviors occurring and the distance at which they occurred.

Personality Variables

Attempts to relate personality variables to interaction distances have been made by several researchers. Rosenfeld (1965) manipulated approval-seeking tendencies by instructing female subjects to approach a female confederate and either seek or avoid her approval. Mean approach distance in the approval-seeking group was 57 inches, in the approval-avoiding group, 94 inches.

Tendency for extroverts to approach the experimenter more closely than introverts in interview sessions and to talk longer in response to questions has been found in two studies (Leipold, 1963; Patterson and Holmes, 1967). However, in another study (Williams, 1963) no differences were found in the approach tendencies of extroverts and introverts, but extroverts did allow others to approach them more closely than introverts.

In a study by Luft (1966) pairs of female subjects who were strangers, met, chatted for a few minutes and then rated their impressions of each other. After this they were asked to estimate the amount of distance between them when they were chatting. Each subject was also given the Taylor Anxiety Scale and it was found that the individual having greater manifest anxiety in a given pair of subjects judged the distance between herself and her partner significantly closer than did her less anxious partner. Judged distance by the more anxious member of the dyad was also less than the actual distance.

There is some evidence to indicate that physically and personally stigmatized people are avoided by others. In one study (Kleck, Buch, Geller, London, Pfeiffer and Vukcovic, 1968) subjects maintained greater personal space when interacting with a stranger believed to have epilepsy than with a stranger for whom this presumption had not been created. The results were

similar when subjects were asked to teach Origami to people with one amputated leg (Kleck, 1969).

Using a projective technique, Kuethe (1962) found tendencies for subjects to group cut-out figures of people in consistent patterns. Human figures were grouped to a greater extent than non-human figures. Figures of children were placed closer to figures of women than those of men. A further study showed a relationship between figure placements and verbal associations (Kuethe, 1964). Those who placed male and female figures close together also tended to give "man" and "woman" as reciprocal verbal associations.

Degree of Acquaintance

In a similar task involving the manipulation of figures, Little (1965) found that interaction distances in a dyad are markedly influenced by the perceived degree of acquaintance of the two members and less so by the setting. If the pair are labeled "friends", they will be seen as interacting at significantly closer distances than if labeled "acquaintances"; if "strangers", at a significantly greater distance. Maximum distances occurred in an office waiting room. Degree of acquaintance and setting were also found to be significant determiners of space when the subjects were children (Guardo, 1969; Meisels and Guardo, 1969; and Bass and Weinstein, 1971). Children stayed closer together in a formal setting (principal's office) than an informal one (living room) and kept farther from "strangers" than from "friends".

Abnormal

In studies involving psychiatric patients' use of personal space, Sommer (1959) found that schizophrenics approached a seated decoy differently than normal subjects did. Horowitz, Duff & Stratton (1964) found that schizo-

phrenics showed greater avoidance of others than normals dis. Wolowitz (1965) instructed subjects, paranoid and nonparanoid schizophrenics, to manipulate the preferred distance for viewing photographs of male and female faces. Paranoids increased the distance between themselves and male photos while nonparanoids were relatively unaffected.

Long, Ziller and Banks (1970) contrasted the responses of institutionalized adolescents with those of normals on a Self-Social Symbols Task, a nonverbal test in which subjects select, arrange or produce symbols to represent the self in relation to symbols representing other persons. In the social interest task, patients placed the self more often outside the group; in the group identification tasks, fewer "others" were placed with the self by the patients and the patients placed the self further from "teacher" and "friend". Fisher (1967) found that children with adjustment problems in school placed human figures at a significantly greater distance apart than did children who were able to adjust successfully to the classroom.

On the other hand, Tolor (1968) tested for psychological distance by means of a modified Kuethe's technique. Schizophrenics consistently replaced the figures closer together than normals.

Horowitz, Duff and Stratton

In an attempt to map the body-buffer zone or personal space bubble, Horowitz, et al. (1964) conducted a series of studies in which subjects were asked to approach an inanimate object of semi-human proportions (a hatrack), a male and a female. Approaches were made to each of the "objects" from front, side and back, and points in between, so that eight measures were taken. Plotted on a graph and connected, these eight points formed an

irregular circle around the subject. This was designated the "body-buffer" zone, a characteristic distance individuals keep between themselves and other people and inanimate objects. As Sommer (1969) surmised, this zone was not circular in shape. Also, the distance was shorter with inanimate objects than with persons, and differed according to the direction of approach. Consistent, nonrandom spacing patterns in a group of sophomores were demonstrated by King (1964), supporting the Horowitz, et al. findings that the body-buffer zone is a consistent, reproducible phenomenon.

Summary

Though findings are sometimes contradictory as to the precise nature of the "body-buffer" zone, a great deal of evidence has been collected indicating that such a zone exists. There appears to be an area of personal space surrounding every individual which seems to be reproducible and may be regarded as an immediate body-buffer zone. Dimensions of this zone are flexible and affected by many variables. A great deal more work will be necessary to determine what these variables are and their effect on the body-buffer zone.

REFERENCES

Aiello, J. & Jones, S.E. Field study of the proxemic behavior of young school children in three subcultural groups. Journal of Personality and Social Psychology, 1971, 19, 351-356.

Aiello, J. & Jones, S. E. Proxemic behavior of black and white first-, third-, and fifth-grade children. Journal of Personality and Social Psychology, 1973, 25, 21-27.

Argyle, M. & Dean, J. Eye-contact, distance, and affiliation. Sociometry, 1965, 28, 289-304.

Bass, M. & Weinstein, M. S. Early development of interpersonal distance in children. Canadian Journal of Behavioral Science, 1971, 3, 368-276.

Baxter, J. C. Interpersonal spacing in natural settings. Sociometry, 1970, 33, 444-456.

Beck, R. Spatial meaning and the properties of the environment. In H. Proshansky, W. Ittelson & L. Rivlin (Ed.), Environmental psychology: man and his physical setting. New York: Holt, Rinehart & Winston, Inc., 1970.

Bloom, R.,Harvey, H., & Howells, G. The development of interpersonal distance in children andadolescents. Presented at a paper session on Spatial and Nonverbal Behavior at the 53rd Annual Convention of the Western Psychological Association, Anaheim, California, 1973.

Bowlby, J. Maternal care and mental health. Geneva, Switzerland: World Health Organization, Monogr. Ser., 1952.

Campbell, D., Kruskal, W. & Wallace, W. Seating aggregation as an index of attitude. Sociometry, 1966, 29, 1-15.

Dosey, M. & Meisel, M. Personal space and self-protection. Journal of Personality and Social Psychology, 1969, 11, 93-97.

Felipe, N. Interpersonal distance and small group interaction. Cornell Journal of Social Relations, 1966, 1, 59-64.

Felipe, N. & Sommer, R. Invasions of personal space. Social Problems, 1966, 14, 206-214.

Fisher, R. Social schema of normal and disturbed school children. Journal of Educational Psychology, 1967, 58, 88-92.

Guardo, C. J. Personal space in children. Child Development, 1969, 40, 143-151.

Guardo, C. J. & Meisels, M. Factor structure of children's personal space schemata. Child Development, 1971, 42, 1307-1312.

Goldberg, G. N., Kiesler, C. A. & Collins, B. E. Visual behavior and face-to-face distance during interaction. Sociometry, 1969, 32, 43-53.

Hall, E. T. The anthropology of manners. Scientific American, 1955, 192, 85-89.

Hall, E. T. The silent language. New York: Doubleday, 1959.

Hall, E. T. The silent language in overseas business. Harvard Business Review, 1960, 38, 87-96.

Hall, E. T. Proxemics, the study of man's spatial relations. In E. Goldston (Ed.) Man's image in medicine and anthropology. New York: International Universities Press, 1963. (a).

Hall, E. T. A system for the notation of proxemic behavior. American Anthropologist, 1963, 65, 1003-1026. (b).

Hall, E. T. The hidden dimension, New York: Doubleday & Company, 1966.

Harlow, H. F. Basic social capacities of primates. Human Biology, 1959, 31, 40-53.

Horowitz, M., Duff, D. & Stratton, L. Personal space and the body-buffer zone. Archives of General Psychiatry, 1964, 11, 651-656.

Jones, S. C. A comparative proxemics analysis of dyadic interaction on selected subcultures of New York City. Journal of Social Psychology, 1971, 84, 35-44.

King, M. G. Structural balance, tension and segregation in a university group. Human Relations, 1964, 17, 221-225.

Kirk, R. E. Experimental design procedures for the behavioral sciences, Belmont, California: Brooks/Cole Publishing Company, 1968.

Kleck, R. Physical stigma and task-oriented interactions. Human Relations, 1969, 22, 53-60.

Kleck, R., Buch, P., Goller, W., London, R., Pfeiffer, J., & Vukcevic, D. Effect of stigmatizing conditions on the use of personal space. Psychological Reports, 1968, 23, 111-118.

Kuethe, J. L. Social Schemas. Journal of Abnormal and Social Psychology, 1962, 64, 31-38.

Kuethe, J. L. Pervasive influence of social schemata. Journal of Abnormal and Social Psychology, 1964, 68, 248-254.

Leibman, M. The effects of sex and race norms on personal space. Environment and Behavior, 1970, 2, 208-245.

Leipold, W. D. Psychological distance in a dyadic interview as a function of introversion-extroversion, anxiety, social desirability and stress. Unpublished doctoral dissertation, University of North Dakota, 1963.

Little, K. B. Personal space. Journal of Experimental Social Psychology, 1965, 1, 237-247.

Little, K. B. Cultural variations in social schemata. Journal of Personality and Social Psychology, 1968, 10, 1-7.

Long, B., Ziller, R. & Henderson, E. Developmental changes in the self-concept during adolescence. School Review, 1968, 76, 210-230.

Long, B., Ziller, R. & Banks, A. Self/other orientation of institutionalized behavioral problem adolescents. Journal of Consulting and Clinical Psychology, 1970, 34, 43-47.

Lott, D. & Sommer, R. Seating arrangements and status. Journal of Personality and Social Psychology, 1967, 7, 90-95.

Luft, J. On nonverbal interaction. Journal of Psychology, 1966, 63, 261-268.

McBride, G., King, M. G. & James, J. W. Social proximity effects on galvanic skin responses in adult humans. Journal of Psychology, 1965, 61, 153-157.

Mehrabian, A. Relationship of attitude to seated posture, orientation and distance. Journal of Personality and Social Psychology, 1968, 10, 26-30.

Mehrabian, A. Some referents and measures of nonverbal behavior. Behavior Research Methods and Instrumentation, 1969, 1, 203-207.

Meisels, M. & Guardo, C. J. Development of personal space schemata. Child Development, 1969, 40, 1167-1178.

Norum, G., Russo, N. & Sommer, R. Seating patterns and group task. Psychology in the Schools, 1967, 4, 276-280.

Patterson, M. L. & Holmes, D. S. Social interaction correlates of the MMPI extroversion-introversion scale. American Psychologist, 1967, 21, 724-725.

Patterson, M. L. & Sechrest, L. B. Impression formation and interpersonal distance. Journal of Personality, 1970, 83, 161-166.

Parten, M. B. Social play among preschool children. Journal of Abnormal and Social Psychology, 1933, 28, 136-147.

Rosenfeld, H. M. Effect of approval-seeking induction on interpersonal proximity. Psychological Reports, 1965, 17, 120-122.

Sommer, R. Studies in personal space. Sociometry, 1959, 22, 247-260.

Sommer, R. Personal space. Canadian Architect, 1960, 7, 76-80.

Sommer, R. Leadership and group geography. Sociometry, 1961, 24, 99-110.

Sommer, R. The distance for comfortable conversation: a further study. Sociometry, 1962, 25, 111-116.

Sommer, R. Further studies in small group ecology. Sociometry, 1965, 28, 337-348.

Sommer, R. Small group ecology. Psychological Bulletin, 1967, 67, 145-152.

Sommer, R. Personal space: the behavioral basis of design. Englewood Cliffs, N. J.: Prentice-Hall, 1969.

Tolor, A. Psychological distance in disturbed and normal children. Psychological Reports, 1968, 23, 695-701.

Watson, O. M. & Graves, T. D. Quantitative research in proxemic behavior. American Anthropologist, 1966, 68, 971-985.

Williams, J. Personal space and its relation to extroversion-introversion. Unpublished master's thesis, University of Alberta, 1963.

Willis, F. N. Initial speaking distance as a function of the speakers' relationship. Psychonomic Science, 1966, 5, 221-222.

Wolowitz, H. M. Attraction and aversion to power: a psychoanalytic conflict theory of homosexuality in male paranoids. Journal of Abnormal Psychology, 1965, 70, 260-270.